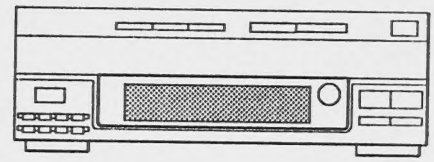
S/M Code No.0080 DATE OF ISSUE 8/1992 - T

aiwa

SERVICE MANUAL

DX-N350M
DX-N351M
DX-N352M



COMPACT DISC PLAYER

• BASIC CD MECHANISM : KSM – 2101ABM

• TYPE. Y, YU

◆DX – N350M is the Compact Disc Player which is connected to XS – N350M, CX – 350M only.
◆DX – N351M is the Compact Disc Player which is connected to CX – N351M only.
◆DX – N352M is the Compact Disc Player which is connected to CX – N352M only.

SPECIFICATIONS

Disc	Compact disc
Scanning method	Non–contact optical scanner (semiconductor laser application)
Laser	Semiconductor laser (λ = 750-800 nm)
Rotation speed	Approx. 500 rpm – 200 rpm (CLV)
Error correction	Cross Interleave, Reed Solomon code
No. of channels	2 channels
D-A conversion	1-bit DAC
Wow/Flutter	Unmeasurable
Signal to noise ratio	92 dB (1 kHz, 0 dB)
Harmonic distortion	0.01% (1 kHz, 0 dB)
Low pass filter	8 times digital filter + active filter
Dimensions (W×H×D)	260 × 90 × 316.5 mm (10 1/4 × 3 5/8 × 12 1/2 in)
Weight	2.8 kg (6.17 lb)

• Design and specifications are subject to change without notice.

AIWA CO.,LTD.

Tokyo Japan

Printed in Japan

CAUTIONS WHEN SERVICING

Model DX-N350M, N351M and N352M do not have a power circuit. These equipment use a 9-pin flat cable to receive the power supply and to output and input signals.

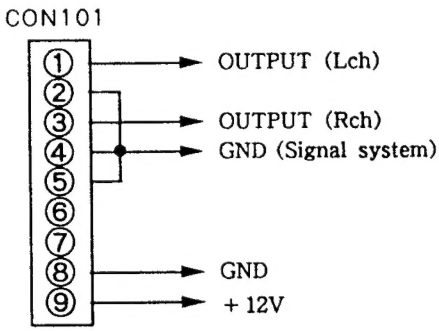
When servicing these equipment, connect them to the devices as shown in Table 1. If the equipment in Table 1 is not available, follow the procedure below.

Table 1

DX – N350M ↓ XS – N350M CX – N350M
DX – N351M ↓ CX – N351M
DX – N352M ↓ CX – N352M

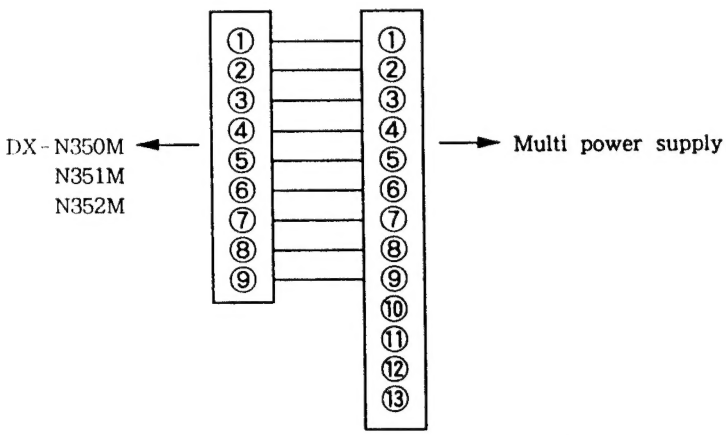
[Repairing a single machine]

① Supply the following voltage to each terminal from the exterminal power supply.

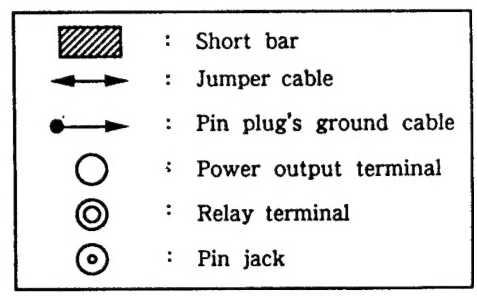


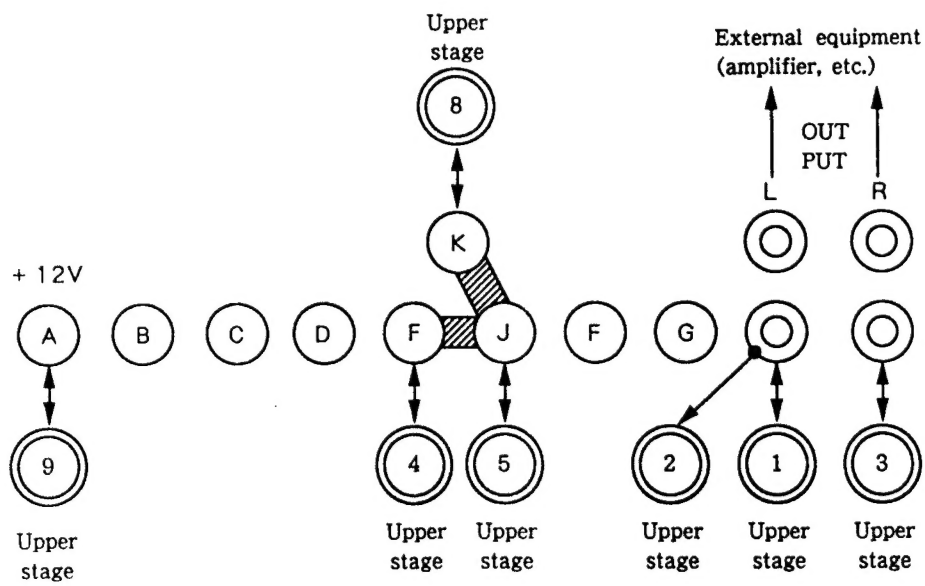
② Multi Power Connection diagram (LPS-9088)

Connect the multi-conversion harness for F550 to the 9-pin FG connector (87-009-877-01).



Connect diagram of multi – conversion harness.





DISASSEMBLY INSTRUCTIONS

1. "Cabinet, Steel" and "Plate, Bottom" Removal (See Figure – 1)
   1) Remove 5 screws (Ⓐ) and remove the "Cabinet, Steel".
   2) Remove 6 screws (Ⓑ× 5, Ⓒ× 1) and remove the "Plate, Bottom".

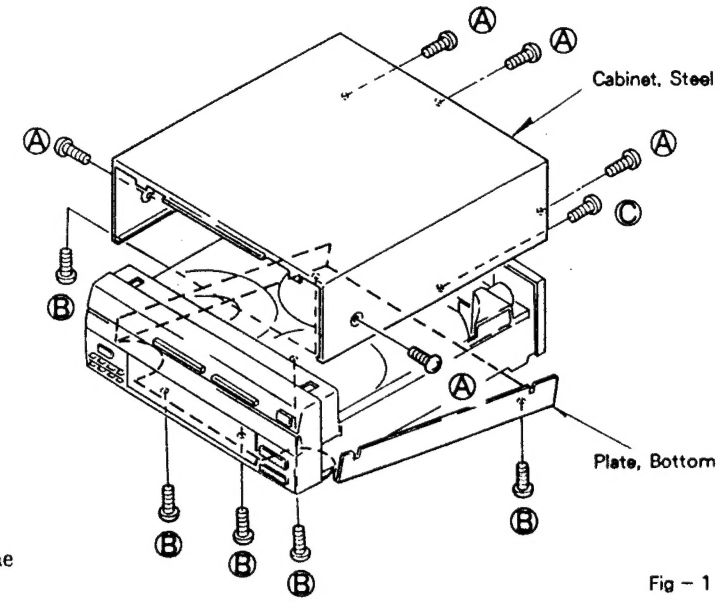


Fig – 1

2. "Cabinet, Front" Removal (See Figure – 2)
   1) Open the "Tray". Connect the power supply to the "Motor, Loading" and open the "Tray".
   1-1) As shown in the figure, supply power (DC5V) to the "Motor, Loading" and open the tray.
   2) Remove the "Panel, Tray" in the direction of the arrow ①.
   3) Remove the connector (CON607).
   4) Remove 2 hooks in the direction of the arrow ② and remove the "Cabinet, Front" in the direction of the arrow ③.

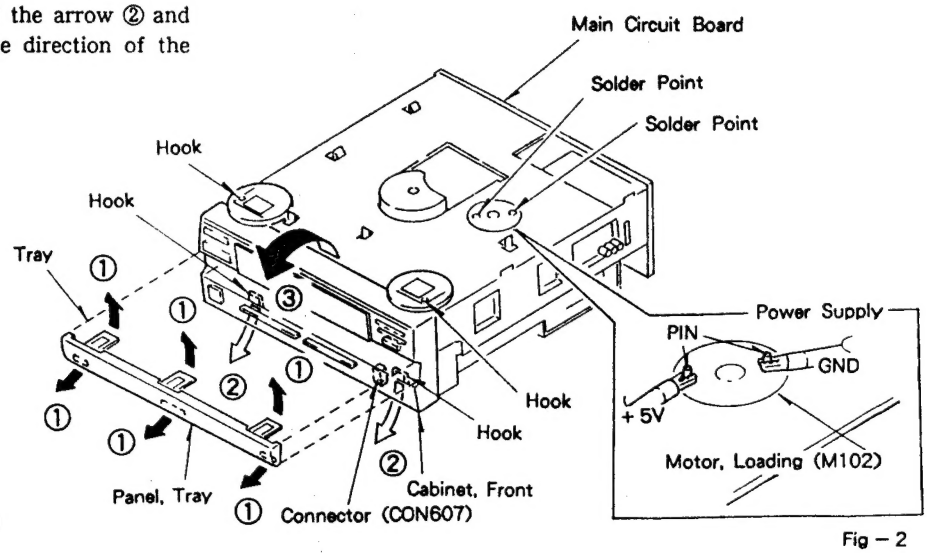


Fig – 2

3. "Main C.B" Removal (See Figure – 3)
   1) Remove screw (Ⓐ).
   2) Desolder the two points on the "Motor, Loading".
   3) Remove 6 hooks and remove the "Main C.B".
   4) Remove 8 connectors (CON601, CON602, CON603, CON604, CON801, CON802, CON301, CON302).

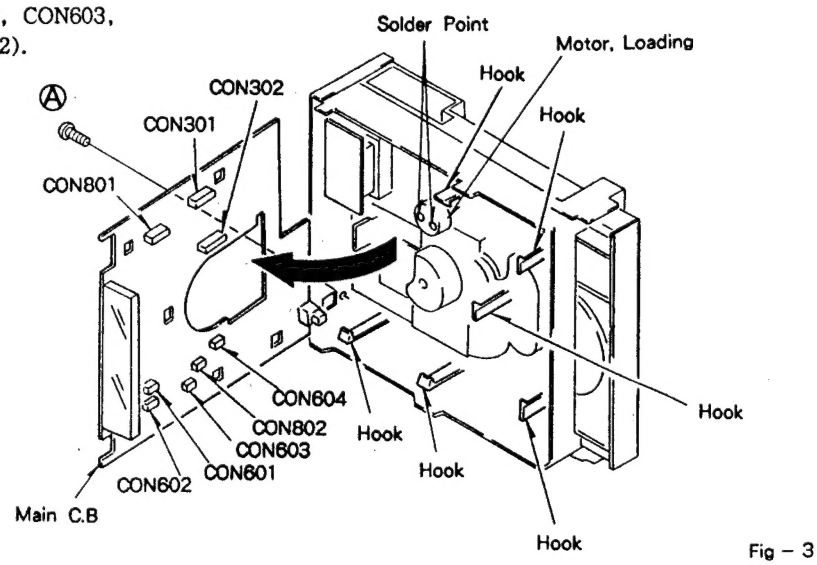
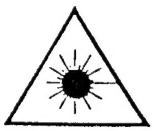


Fig – 3

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs laser. Therefore, be sure to follow carefully the instructions below when servicing.

WARNING!!
WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION. BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.



- Caution: Invisible laser radiation when open and interlocks defeated avoid exposure to beam.
- Advarsel: Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion.
  Undgå udsættelse for stråling.

VAROITUS!
Laiteen Käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyt-täjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

VARNING!
Om apparaten används på annat sätt än vad som specificeras i denna bruksanvisning, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

ATTENTION
L'utilisation de commandes, réglages ou procédures autres que ceux spécifiés peut entraîner une dangereuse exposition aux radiations.

This Compact Disc player is classified as a CLASS 1 LASER product.
The CLASS 1 LASER PRODUCT label is located on the rear exterior.

CLASS 1
LASER PRODUCT

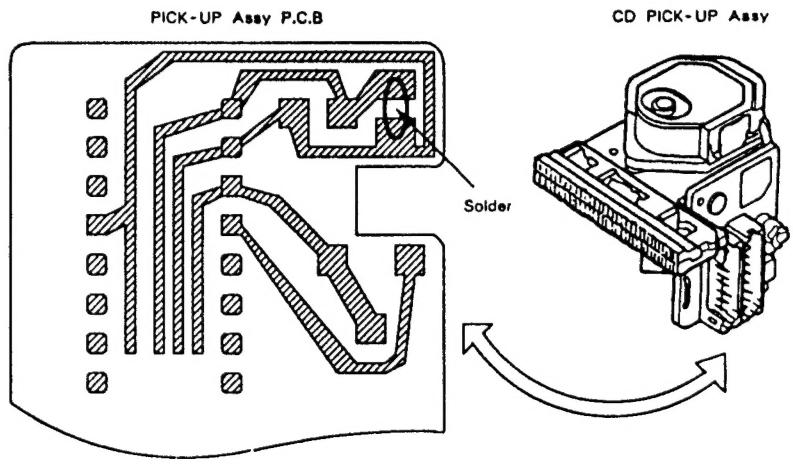
LUOKAN 1
LASERLAITE

KLASS 1
LASER APPARAT

Precaution to replace Optical block (KSS – 210A)

Body or clothes electrostatic potential could ruin laser diode in the optical block. Be sure to ground body and workbench, and make sure the clothes do not touch the diode.

1) After the connection, remove the solder shown in the right figure.



■ ACCESSORIES/PACKAGE LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q,TY
	1	★81-VM1-901-110	INSTRUCTION BOOKLET, UH		1

ELECTRICAL MAIN PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
	===IC===	
	87-002-639-010	IC, BA6296FP
	87-001-184-010	IC, CXA1081S
	87-001-400-010	IC, CXA1082S
	87-001-944-010	IC, CXD1167Q
	81-VM1-636-010	IC, CXP50120-145Q
	87-002-211-010	IC, GP1F32T(DIGITAL OUT)
	87-002-394-010	IC, LB1641
	87-002-348-010	IC, NJM4580D
	87-020-881-010	IC, NJM78L05A
	87-002-448-010	IC, TC9237N
	===TRANSISTOR===	
	89-112-964-010	TRANSISTOR, 2SA1296Y
	89-113-187-010	TRANSISTOR, 2SA1318TU
	89-213-702-010	TRANSISTOR, 2SB1370E
	89-318-154-010	TRANSISTOR, 2SC1815Y
	89-325-002-010	TRANSISTOR, 2SC2500
	89-406-555-010	TRANSISTOR, 2SD655E
	87-026-572-010	TRANSISTOR, DTA114TS
	87-026-486-010	TRANSISTOR, DTA144TS
	87-026-218-010	TRANSISTOR, DTC144ES
	===DIODE===	
	87-020-870-010	DIODE, 1S1585
	87-020-465-010	DIODE, 1SS133
	87-002-608-010	DIODE, DSF10TC
	87-002-850-010	DIODE, ZENER HZ4B2
	87-027-555-010	DIODE, ZENER HZ5C2
	87-027-652-010	DIODE, ZENER HZ9A1L
	===MAIN CIRCUIT BOARD SECTION===	
C101	★87-010-405-010	CAP, ELECT 10-50 SME
C102	★87-010-405-010	CAP, ELECT 10-50 SME
C103	★87-018-126-010	CAP, CERA-SOL SS 390P-50 B
C104	★87-018-126-010	CAP, CERA-SOL SS 390P-50 B
C107	★87-018-113-010	CAP, CERA-SOL SS 33P-50 SL
C108	★87-018-113-010	CAP, CERA-SOL SS 33P-50 SL
C109	★87-018-117-010	CAP, CERA-SOL SS 68P-50 SL
C110	★87-018-117-010	CAP, CERA-SOL SS 68P-50 SL
C111	★87-018-113-010	CAP, CERA-SOL SS 33P-50 SL
C112	★87-018-113-010	CAP, CERA-SOL SS 33P-50 SL
C113	★87-010-404-010	CAP, ELECT 4.7-50 SME
C114	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C115	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C116	★87-010-260-010	CAP, ELECT 47-25 SME
C117	★87-010-263-010	CAP, ELECT 100-10
C118	★87-010-263-010	CAP, ELECT 100-10
C119	★87-018-113-010	CAP, CERA-SOL SS 33P-50 SL
C120	★87-018-113-010	CAP, CERA-SOL SS 33P-50 SL
C121	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C122	★87-010-263-010	CAP, ELECT 100-10
C130	★87-018-209-010	CAP, CERA-SOL SS 0.1-50 F
C201	★87-018-132-010	CAP, CERA-SOL SS 2200P-16 X
C202	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C203	★87-018-202-010	CAP, CERA-SOL SS 6800P-16 X
C207	★87-010-405-010	CAP, ELECT 10-50 SME
C211	★87-018-199-010	CAP, CERA-SOL SS 3300P-16 X
C212	★87-010-403-010	CAP, ELECT 3.3-50 SME
C213	★87-010-382-010	CAP, ELECT 22-25 SME
C216	★87-010-374-010	CAP, ELECT 47-10
C220	★87-018-133-010	CAP, CERA-SOL SS 4700P-16 X
C221	★87-010-401-010	CAP, ELECT 1-50 SME
C222	★87-010-401-010	CAP, ELECT 1-50 SME
C230	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C231	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C302	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C303	★87-010-400-010	CAP, ELECT 0.47-50 SME
C305	★87-018-132-010	CAP, CERA-SOL SS 2200P-16 X
C307	★87-010-374-010	CAP, ELECT 47-10
C308	★87-010-374-010	CAP, ELECT 47-10
C309	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C310	★87-010-374-010	CAP, ELECT 47-10
C401	★87-010-263-010	CAP, ELECT 100-10
C402	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C404	★87-010-400-010	CAP, ELECT 0.47-50 SME
C405	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C406	★87-018-131-010	CAP, CERA-SOL SS 1000P-50 B
C502	★87-010-260-010	CAP, ELECT 47-25 SME
C503	★87-018-209-010	CAP, CERA-SOL SS 0.1-50 F
C504	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C505	★87-010-405-010	CAP, ELECT 10-50 SME
C506	★87-010-374-010	CAP, ELECT 47-10
C512	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C513	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C516	★87-010-260-010	CAP, ELECT 47-25 SME
C522	★87-010-406-010	CAP, ELECT 22-50 SME
C526	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C527	★87-018-200-010	CAP, CERA-SOL SS 3900P-16 X
C528	★87-010-263-010	CAP, ELECT 100-10
C529	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C531	★87-010-221-010	CAP, ELECT 470-10
C532	★87-010-260-010	CAP, ELECT 47-25 SME
C801	★87-010-263-010	CAP, ELECT 100-10
C802	★87-010-370-010	CAP, ELECT 330-6.3 SME
C803	★87-018-115-010	CAP, CERA-SOL SS 47P-50 SL
C804	★87-018-115-010	CAP, CERA-SOL SS 47P-50 SL
C805	★87-018-115-010	CAP, CERA-SOL SS 47P-50 SL
C806	★87-018-115-010	CAP, CERA-SOL SS 47P-50 SL
C807	★87-018-128-010	CAP, CERA-SOL SS 560P-50 B
C808	★87-018-134-010	CAP, CERA-SOL SS 0.01-16 Y
C809	★87-018-128-010	CAP, CERA-SOL SS 560P-50 B
C825	★87-010-404-010	CAP, ELECT 4.7-50 SME
C990	★87-018-131-010	CAP, CERA-SOL SS 1000P-50 B
C991	★87-018-131-010	CAP, CERA-SOL SS 1000P-50 B
EMI101	★87-008-372-010	FILTER, EMI BL OIRNI
EMI102	★87-008-372-010	FILTER, EMI BL OIRNI
EMI103	★87-008-372-010	FILTER, EMI BL OIRNI
EMI104	★87-008-372-010	FILTER, EMI BL OIRNI
F101	★87-008-394-010	FILTER, CERAMIC CST 4.19MGW
FL101	★81-VM1-637-010	FL, 7BT-171GK(DISPLAY)
L301	★87-003-147-010	COIL, 22UH
L401	★87-003-147-010	COIL, 22UH
L502	★87-007-311-010	COIL, OSC DDCON V
L801	★87-003-147-010	COIL, 22UH
M102	87-045-305-010	MOTOR, RF-500TB(LOADING MOTOR)
R410	★87-025-407-010	RES, MF 100K-1/8W
R412	★87-025-407-010	RES, MF 100K-1/8W
⚠R507	★87-029-129-010	RES, FUSE 3.3-1/4W
⚠R522	★87-029-129-010	RES, FUSE 3.3-1/4W
SFR101	★87-024-169-010	SFR, 2.2K
SFR103	★87-024-173-010	SFR, 22K
SFR301	★87-024-173-010	SFR, 22K
SFR302	★87-024-173-010	SFR, 22K
X102	★87-030-270-010	XTAL RESONATOR 16.9344MHZ
	===TACT-1 CIRCUIT BOARD SECTION===	
LED701	89-VW5-606-010	LED, SLH-38MC, 70F-90 (▶❚❚PLAY/PAUSE)
LED702	89-VW5-606-010	LED, SLH-38MC, 70F-90(▶▶/▶▶❚)
LED703	89-VW5-606-010	LED, SLH-38MC, 70F-90(❚◀◀/◀◀)
LED704	89-VW5-606-010	LED, SLH-38MC, 70F-90(■)
SW701	87-036-215-010	TACT SW(■)
SW702	87-036-215-010	TACT SW(▶❚❚PLAY/PAUSE)
SW703	87-036-215-010	TACT SW(▶▶/▶▶❚)

REF. NO.	PART NO.	DESCRIPTION
SW704	87-036-215-010	TACT SW(⏮/◀◀)
===TACT-2 CIRCUIT BOARD SECTION===		
SW705	87-036-215-010	TACT SW(POWER)
SW706	87-036-215-010	TACT SW(RANDOM)
SW707	87-036-215-010	TACT SW(PRGM)
SW708	87-036-215-010	TACT SW(REPEAT)
SW709	87-036-215-010	TACT SW(T-PRGM)
SW710	87-036-215-010	TACT SW(DELETE)
SW711	87-036-215-010	TACT SW(DISPLAY)
SW712	87-036-215-010	TACT SW(AI EDIT)
SW713	87-036-215-010	TACT SW(CONT EDIT)
===TACT-3 CIRCUIT BOARD SECTION===		
SW714	87-036-215-010	TACT SW(1)
SW715	87-036-215-010	TACT SW(⏏OPEN/CLOSE)
SW716	87-036-215-010	TACT SW(DISC CHANGE)
SW717	87-036-215-010	TACT SW(DISC SKIP)
SW718	87-036-215-010	TACT SW(3)
SW719	87-036-215-010	TACT SW(2)
===PHOTO CIRCUIT BOARD SECTION===		
PH601	87-026-573-010	P-SENSOR, GP1S53V
===MOTOR 1 CIRCUIT BOARD SECTION===		
M101	87-045-305-010	MOTOR, RF-500TB(TURN TABLE MOTOR)
===MOTOR-2 CIRCUIT BOARD SECTION===		
M103	9X-262-513-210	MOTOR GEAR ASSY(SLED)
M104	9X-262-513-310	MOTOR ASSY(W/CHASSIS, T.T) (SPINDLE)
SW101	91-572-085-110	LEAF SW(INSIDE LIMIT)
===SWITCH-1 CIRCUIT BOARD SECTION===		
SW603	87-036-109-010	PUSH, SW(CLOSE SW)
===SWITCH-2 CIRCUIT BOARD SECTION===		
SW601	87-036-271-010	LEVER, SW(UP/DOWN SW)
===SWITCH-3 CIRCUIT BOARD SECTION===		
SW602	87-036-271-010	LEVER, SW(OPEN SW)
===MISCELLANEOUS===		
	98-848-127-110	OPTICAL PICK UP KSS-210A
	★89-VT5-202-010	BUSHING, CORD
CON101	★81-VM1-647-010	WIRE ASSY, 9P FG

TRANSISTOR ILLUSTRATION

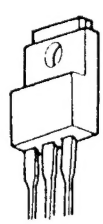
E C B

2SA1296

2SA1318

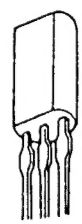
2SC1815

2SD655



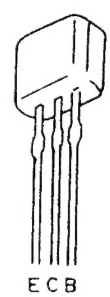
B C E

2SB1370



ECB

2SC2500



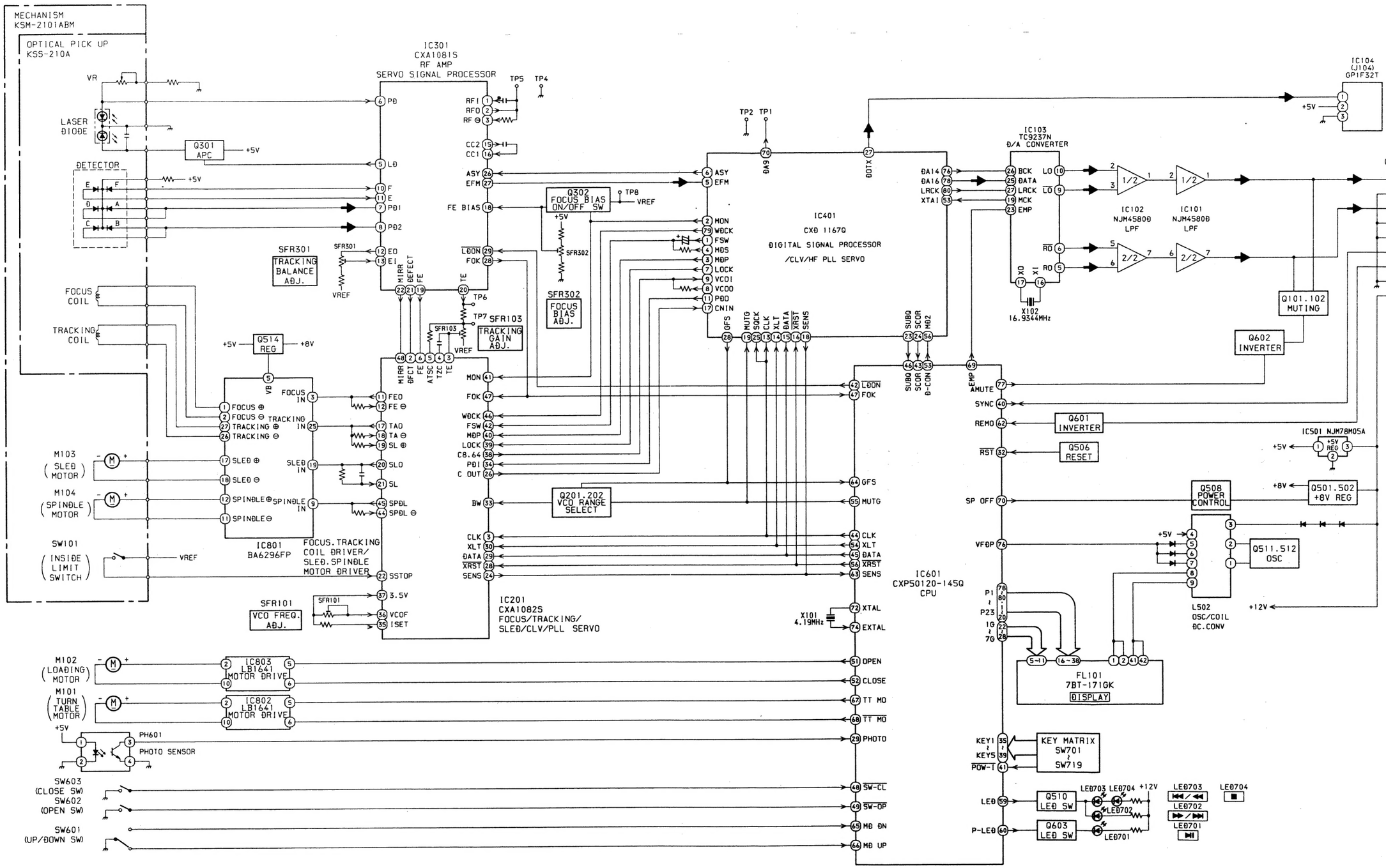
ECB

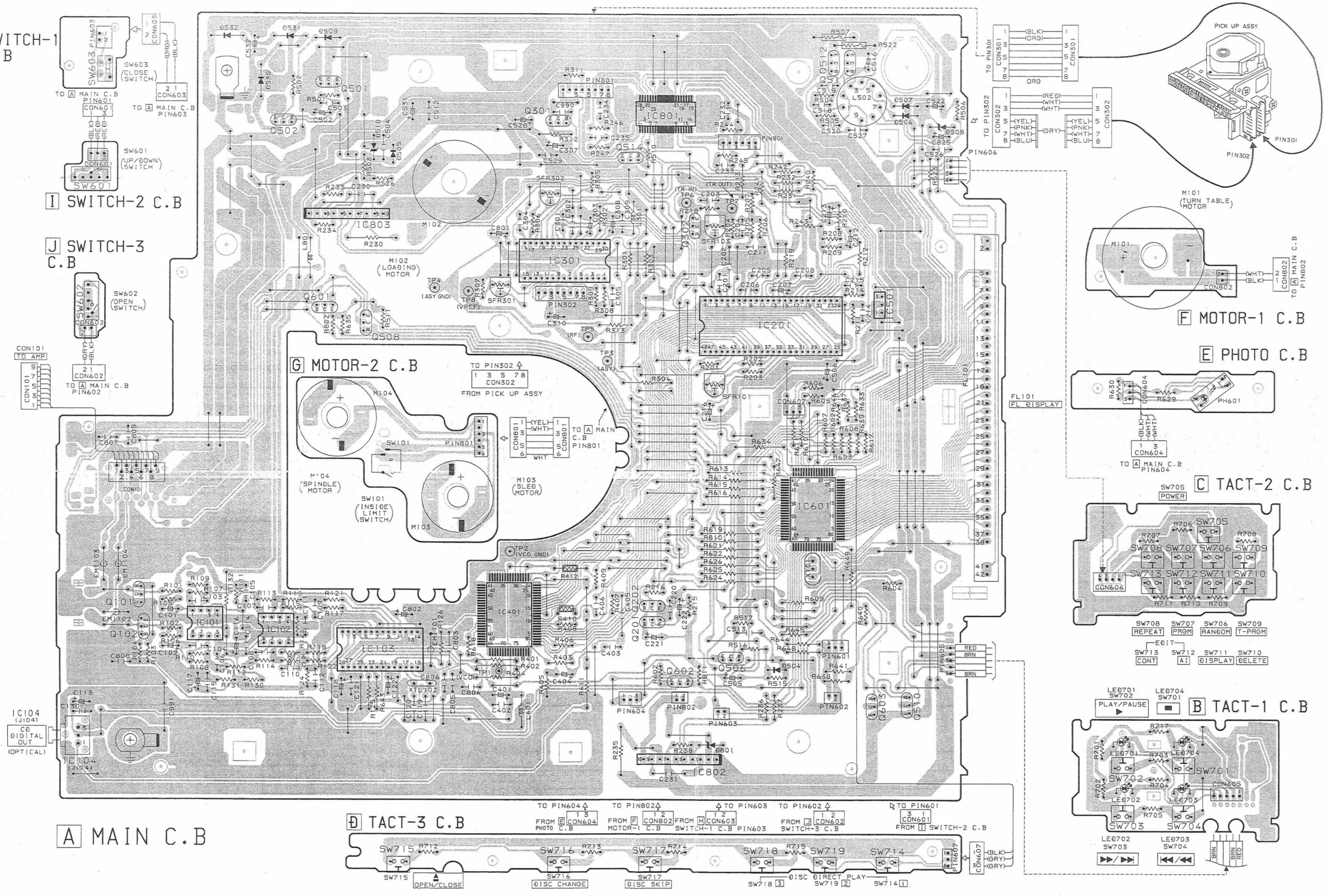
DTA114

DTA144

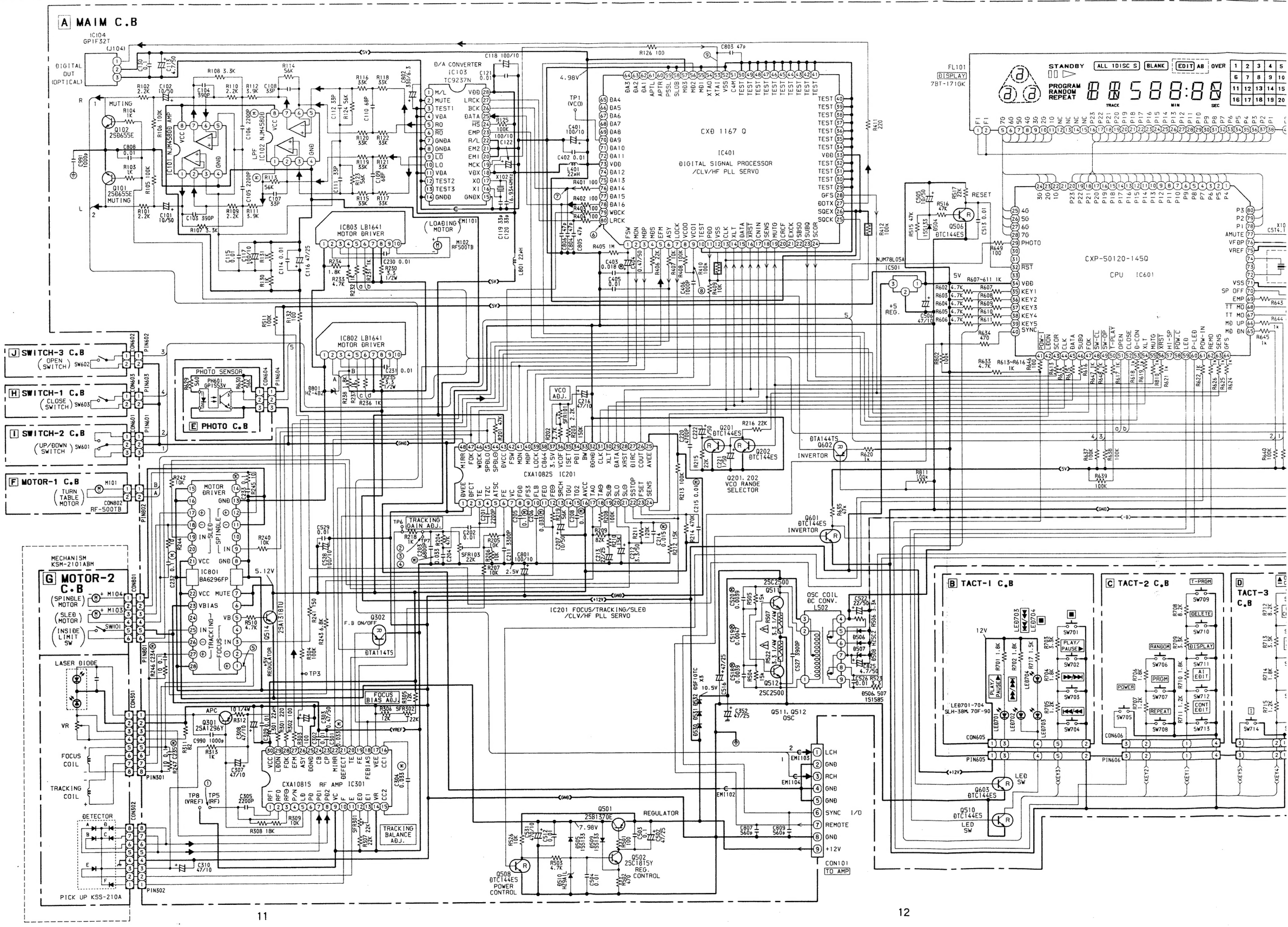
DTC144

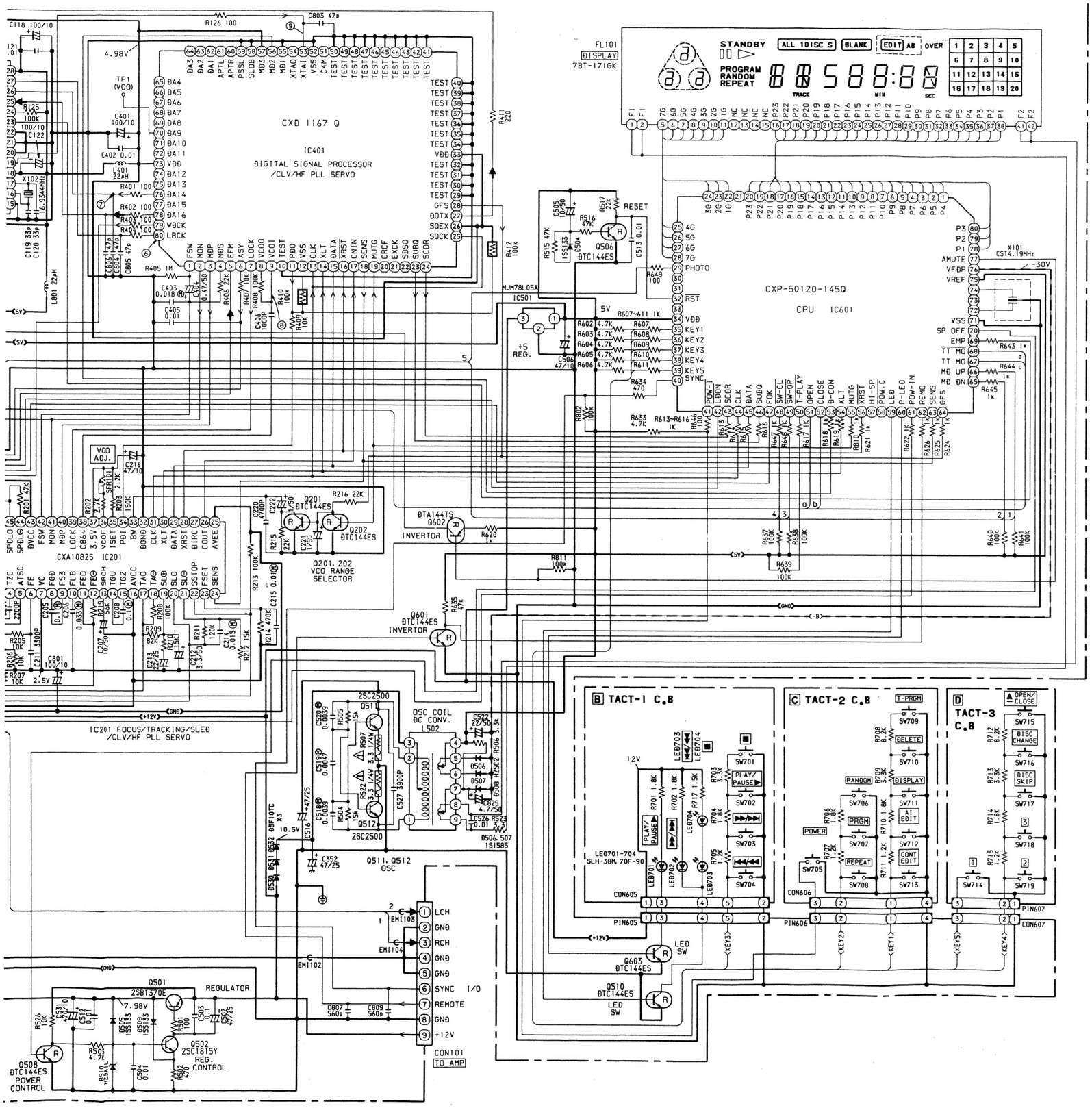
BLOCK DIAGRAM




H SWITCH-1 C.B
SW603 (CLOSE (SWITCH)
TO A MAIN C.B PIN601
TO A MAIN C.B PIN603
SW601 (UP/DOWN) (SWITCH
I SWITCH-2 C.B
J SWITCH-3 C.B
SW602 (OPEN (SWITCH)
TO A MAIN C.B PIN602
G MOTOR-2 C.B
TO PIN302
FROM PICK UP ASSY
M104 (SPINDLE) MOTOR
SW101 (INSIDE LIMIT SWITCH)
M103 (SLED) MOTOR
M102 (LOADING) MOTOR
TO A MAIN C.B PIN801
PICK UP ASSY
PIN301
PIN302
M101 (TURN TABLE) MOTOR
F MOTOR-1 C.B
TO A MAIN C.B PIN802
E PHOTO C.B
TO A MAIN C.B PIN604
C TACT-2 C.B
SW705 POWER
SW708 REPEAT
SW707 PRGM
SW706 RANDOM
SW709 T-PRGM
EDIT
SW713 CONT
SW712 AI
SW711 DISPLAY
SW710 DELETE
B TACT-1 C.B
LED701 SW702 PLAY/PAUSE
LED704 SW701
LED702 SW703
LED703 SW704
D TACT-3 C.B
SW715 OPEN/CLOSE
SW716 DISC CHANGE
SW717 DISC SKIP
SW718 3
SW719 DISC DIRECT PLAY 2
SW714 1
A MAIN C.B
IC104 (J104) CD DIGITAL OUT (OPTICAL)
FL101 FL DISPLAY
TO PIN604 FROM E PHOTO C.B CON604
TO PIN802 FROM F MOTOR-1 C.B CON802
TO PIN603 FROM H SWITCH-1 C.B PIN603 CON603
TO PIN602 FROM J SWITCH-3 C.B CON602
TO PIN601 FROM I SWITCH-2 C.B CON601
IC801
IC601
IC201
IC401
IC301
IC803
IC101
IC102
IC103
IC501
IC802
Q501
Q502
Q514
Q301
Q601
Q508
Q101
Q102
Q602
Q505
Q603
Q510
Q201
Q202
Q203
Q204
TP1
TP2 (VCO GND)
TP3 (ASY)
TP4 (ASY GND)
TP5 (RF)
TP6 (TR-IN)
TP7 (TR OUT)
TP8 (VREF)
SFR101
SFR301
SFR302
SFR103
XTL101
XTL102
PIN601
PIN602
PIN603
PIN604
PIN605
PIN606
PIN607
PIN801
PIN802
CON101 TO AMP
CON601
CON602
CON603
CON604
CON605
CON606
CON607
CON801
CON802
CON301
CON302
ORG
RED
BRN
WHT
BLK
GRY
YEL
PNK
BLU

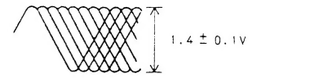
SCHEMATIC DIAGRAM





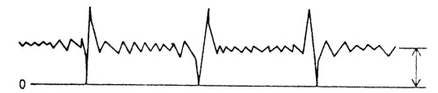
WAVE FORM

①



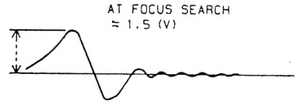
VP-P SHOULD BE APPROX. 1.4x.
WHEN PLAYING TRACK-2 OF YEDS-18.

②

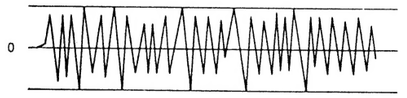


200mV/DIV
2mS/DIV

③

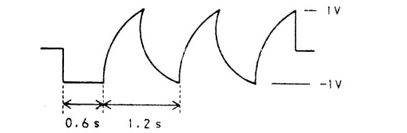


④

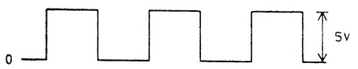


500mV/DIV
1mS/DIV

⑤ (WHEN VDD ON WITHOUT DISC AND TRAY IS CLOSED.)



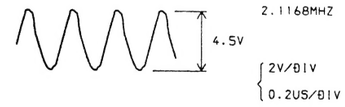
⑥



88.2KHZ

2V/DIV
5US/DIV

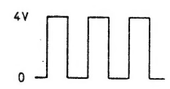
⑦



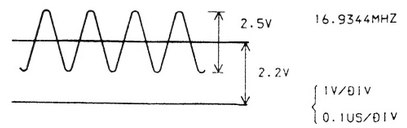
2.1168MHZ

2V/DIV
0.2US/DIV

⑧



⑨



16.9344MHZ

1V/DIV
0.1US/DIV

IC DESCRIPTION

IC, CXA1081S

Pin No.	Pin Name	I/O	Description
1	RF1	I	The RF summing amplifier output is C-connected and input.
2	RF0	O	RF summing amplifier output. Eye pattern test point.
3	RF	I	Inverting input of the RF summing amplifier. A feedback resistor is connected between pins 2 and 3.
4	P/N	I	Switches the input according to the polarity of the laser diode. (Not used.)
5	LD	O	Output to control the laser diode output.
6	PD	I	Connects the photo-detector which detects the laser diode output.
7	PD1	I	RF1-V amplifier (1) inverting input. Connected to PIN diode A + C for the current intput.
8	PD2	I	RF1-V amplifier (2) inverting input. Connected to PIN diode B + D for the current input.
9	VC	I	Reference voltage input within the IC. Connected to pin 14 with single power supply. Connected to the ground with the positive and negative power supply.
10	F	I	F1-V amplifier inverting input. Connected to PIN diode F for the current input.
11	E	I	E1-V amplifier inverting input. Connected to PIN diode E for the current input.
12	E0	O	E1-V amplifier output. A feedback resistor is connected.
13	E1	I	Adjusts the E1-V amplifier gain.
14	VR	O	Outputs the neutral voltage. Connected to pin 9 with the single power supply. OPEN with positive and negative power supply.
15	CC1	O	Defect bottom hold (1) output. A capacitor is connected between pins 15 and 16.
16	CC2	I	The defect bottom (1) output is C-connected and input.
17	VEE	–	Grounded with the single power supply. Becomes a negative power supply with the positive and negative power supply.
18	FE BIAS	I	Inputs a bias voltage for the positive-phase input of the focus error amplifier.
19	FE	O	Focus error amplifier output.
20	TE	O	Tracking error amplifier output.
21	DEFECT	O	Defect detection output. Outputs the "H" signal that detects a defect on the mirror surface.
22	MIRR	O	Mirror comparator output.
23	CP	O	A mirror hold capacitor is connected to this pin.
24	CB	O	The defect bottom hold (2) capacitor is connected to this pin.
25	DGND	–	Ground in the digital circuit.
26	ASY	I	Auto-symmetry control input.
27	EFM	O	EFM output comparator output.
28	FOK	O	Focus OK output.
29	$\overline{\text{LD ON}}$	I	Laser diode ON/OFF control input.
30	VCC	–	Positive power supply.

IC, CXA1082S

Pin No.	Pin Name	I/O	Description
1	DVEE	–	-5V terminal. (Connected to GND.)
2	DFCT	I	Interface input terminal for microcomputer.
3	TE	I	Tracking error signal input terminal.
4	TZC	I	Tracking zero-cross comparator input terminal.
5	ATSC	I	ATSC detection window comparator input terminal.
6	FE	I	Focus error signal input terminal.
7	VC	–	Connected to VREF.
8	FGD	O	Capacitor is inserted between this pin and pin 3 to decrease the focus servo's high-frequency gain.
9	FS3	I	Focus servo's high-frequency gain is selected by FS3 on/off operation.
10	FLB	O	Time-constant external terminal for raising the focus servo's low-frequency range.
11	FEO	O	Power transistor drive's operational amplifier output terminal.
12	FE⊖	I	Focus amplifier inversion input terminal.
13	SRCH	O	Time-constant external terminal for forming a focus search wave.
14	TG0	O	Time-constant external terminal for tracking high-frequency gain selection.
15	TG2	O	Time-constant external terminal for tracking high-frequency gain selection.
16	AVCC	–	+5V terminal.
17	TAO	O	Tracking error signal output terminal.
18	TA⊖	I	Tracking amplifier's inversion input terminal.
19	SL⊕	I	Sleding amplifier's noninversion input terminal.
20	SLO	O	Sleding amplifier output terminal.
21	SL⊖	I	Sleding amplifier's inversion input terminal.
22	SSTOP	I	On/off detection signal terminal of disc's innermost detection limit switch.
23	FSET	I	Terminal for setting the focus tracking's phase compensation peak and CLV LPF (f0).
24	SENS	O	Outputs IC's internal state corresponding to data address. (It is changed according to address of internal serial register.)
25	AVEE		-5V terminal. (Connected to GND.)
26	C. OUT	O	Outputs signal for counting number of tracks in high-speed mode.
27	$\overline{\text{DIRCT}}$	I	Used in one-track jump. Normally "H". "L" when track jump pulse is inversed. Consequently "H" when normal tracking mode is set. "L" in a period when the rising and falling edges of TZC are detected. (Not used.)
28	$\overline{\text{XRST}}$	I	"L" when all the internal register are cleared.
29	DATA	I	Serial data transmission from CPU. Input started from LSB.
30	$\overline{\text{XLT}}$	I	"L" when data of internal serial shift register is transmitted to the latch address-decoded.
31	CLK	I	DATA transmission clock. Data is taken in at the falling edge.
32	D GND	–	GND terminal.
33	BW	I	Loop filter's time-constant external terminal.
34	PDI	I	CXD1167Q phase comparator output PDO input terminal.
35	ISET	I	Passes a current to determine the focus search, tracking jump, and threading kick height.

Pin No.	Pin Name	I/O	Description
36 37	VCOF 3.5V	I	VCO's free-running frequency is proportional to the resistance value between this pin and pin 31.
38	C864	O	8.64MHz VCO output terminal.
39	LOCK	I	Connected to the LOCK terminal of CXD1167Q.
40	MDP	I	CXD1167Q MDP connection terminal.
41	MON	I	CXD1167Q MON connection terminal.
42	FSW	I	LPF time-constant external terminal of CLV servo's error signal.
43	DVCC	—	+5V terminal.
44	SPDL⊖	I	Spindle drive amplifier's inversion input terminal.
45	SPDLO	O	Spindle motor drive terminal.
46	WDCK	I	Word clock signal input terminal.
47	FOK	I	Focus OK signal input terminal.
48	MIRR	I	Mirror signal input terminal.

IC, CXP50120 – 145Q

Pin No.	Pin Name	I/O	Description
1 ∫ 20 78 79 80	P1 ∫ P23	O	Display segment output.
21	NC	—	Not used.
22 ∫ 28	1G ∫ 7G	O	Display grid output.
29	PHOTO	I	PHOTO sensor input.
30	TX	—	Not used.
31	TEX	—	Not used.
32	$\overline{RST}$	I	Reset input.
33	NC	—	Not used.
34	V_{DD}	—	Power supply terminal.
35 ∫ 39	KEY1 ∫ KEY5	I	KEY input.
40	SYNC	I/O	Input and output of synchronizing signal with external device. (8 bit serial)
41	$\overline{POW-I}$	I	Power SW input. Switch of ON/OFF. (STAND BY)
42	$\overline{LDON}$	O	Laser diode ON/OFF output. "L" output when ON.
43	SCOR	I	Interruption when subcode S0 + S1 input falls.
44	CLK	O	Data transfer clock.
45	DATA	O	Serial data output to DSP.

Pin No.	Pin Name	I/O	Description
46	SUBQ	I	Subcode Q input.
47	FOK	I	Indicates the status of the focus. "H" when focused.
48	$\overline{\text{SW-CL}}$	I	Informs that the tray is fully inserted. "L" when fully inserted.
49	$\overline{\text{SW-OP}}$	I	Informs that the tray is fully ejected. "L" when fully ejected.
50	$\overline{\text{T-PLAY}}$	I	TIMER PLAY ON/OFF terminal. "L" when ON.
51	OPEN	O	Tray open output. "H" output when opening action.
52	CLOSE	O	Tray close output. "H" output when closing action.
53	D-CON	O	DIGITAL OUT ON/OFF. OFF when "H".
54	XLT	O	Data latch output.
55	MUTG	O	Muting output to DSP.
56	$\overline{\text{XRST}}$	O	System reset output.
57	HI-SP	O	"H" when playback is set to twice the normal speed. (Not used.)
58	$\overline{\text{POW. C}}$	O	System ON/OFF output. "H" output when OFF. (Not used.)
59	LED	O	LED lights when CD function. ON when "H".
60	P-LED	O	LED lights when CD function and LED blinks when PLAY. ON when "H".
61	POW-IN	—	Not used.
62	REMO	I	42 bit serial remote control input.
63	SENS	I	Connected to the SENS terminal of DSP.
64	GFS	I	Frame sink lock status display signal input.
65	MD-DN	I	Informs that MD falls entirely. "L" when falls entirely.
66	MD-UP	I	Informs that MD rises entirely. "L" when rises entirely.
67	TT MO	O	For TURN TABLE reverse rotation. Rotates when "H".
68	$\overline{\text{TT MO}}$	O	For TURN TABLE forward rotation. Rotates when "H".
69	EMP	O	Emphasis ON/OFF switch. ON when "H".
70	SP-OFF	O	DSP SSP. "H" when RF amplifier OFF.
71	V_{SS}	—	Connected to the GND.
72	XTAL	—	Not used.
73	NC	—	Not used.
74	EXTAL	I	Not used.
75	V_{REF}	—	Connected to GND.
76	V_{FDP}	—	Power supply input for FL tube display output.
77	AMUTE	O	"L" output when analog mute output ON.

IC, TC9237N

Pin No.	Pin Name	I/O	Description
1	M/L	I	MSB First/LSB First select terminal for input data. "H" when MSB First. "L" when LSB First.
2	MUTE	I	Muting terminal. "H" when muting output signal.
3	AT	I	Attenuator control terminal.
4	VDA	—	DA converter power supply terminal. (R channel)
5	RO	O	R channel data output terminal.
6	$\overline{\text{RO}}$	O	R channel data output terminal.
7	GNDA	—	DA converter GND terminal. (R channel)
8	GNDA	—	DA converter GND terminal. (L channel)
9	$\overline{\text{LO}}$	O	L channel data output terminal.
10	LO	O	L channel data output terminal.
11	VDA	—	DA converter power supply terminal. (L channel)
12	C	I	TEST terminal. Normally set to "L" for use.
13	TEST	I	TEST terminal. Normally set to "H" or OPEN for use.
14	GND	—	Logic GND terminal.
15	GNDX	—	Oscillator output GND terminal.
16	XI	I	Crystal oscillator connection terminal. Generates the necessary system clock when the crystal oscillator is connected. 384fs.
17	XO	O	
18	VDX	—	Oscillator output power supply terminal.
19	MCK	O	System clock output terminal. 384 fs.
20	EM1	I	De-emphasis filter 44.1 kHz/32 kHz/48 kHz mode select terminal. Mode
21	EM2	I	
22	R/L	I	R/L select terminal. R channel data when "H" and L channel data input when "L" during "H" as LRCK signal. L channel data when "H" and R channel data input when "L" during "L" as LRCK signal.
23	EMP	I	De-emphasis filter ON/OFF select terminal. "H" when ON. "L" when OFF.
24	$\overline{\text{HS}}$	I	Normal/High speed mode select terminal. "H" when Normal speed mode. "L" when High speed mode. (Not used.)
25	DATA	I	Data input terminal.
26	BCK	I	Bit clock input terminal.
27	LRCK	I	LR clock input terminal.
28	VDD	—	Logic power supply terminal.

EM1	L	L	H	H
EM2	L	H	H	L
MODE	44.1kHz		32kHz	48kHz

IC, CXD1167Q

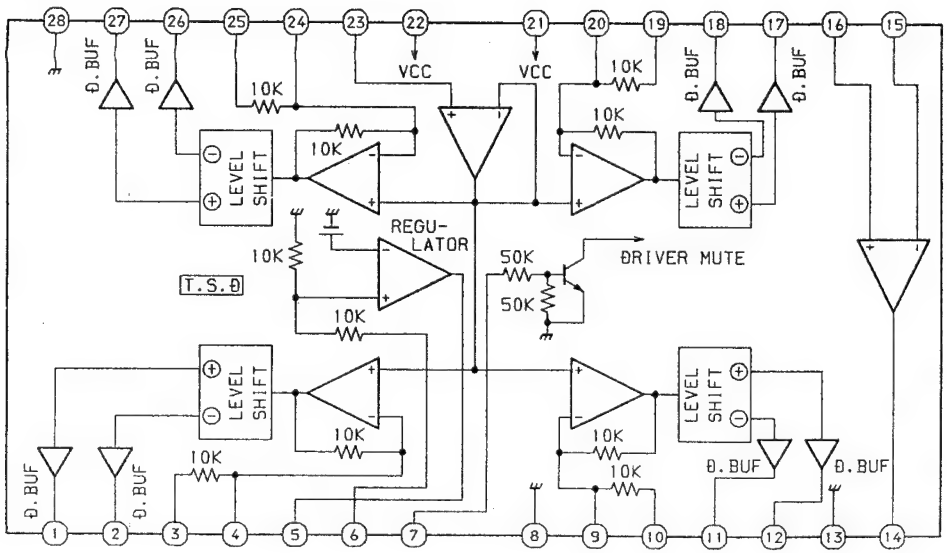
Pin No.	Pin Name	I/O	Description
1	FSW	O	Output to switch the time constant of the spindle motor output filter.
2	MON	O	Spindle motor ON/OFF control output.
3	MDP	O	Spindle motor drive output. Coarse control in the CLV. S mode and phase control in the CLV.P mode.
4	MDS	O	Spindle motor drive output. Speed control in the CLV. S mode.
5	EFM	I	Inputs an EFM signal from the RF amplifier.
6	ASY	O	Output to control the slice level of the EFM signal.
7	LOCK	O	The GFS signal is sampled by the WFCK/16. When the GFS signal is "H", this pin outputs "H", and when the signal is "L" 8 times continuously, it outputs "L".
8	VCOO	O	VCO output. When this is locked to the EFM signal, f = 8.6436MHz.
9	VCOI	I	VCO input.
10	TEST	—	Connected to GND. (0V)
11	PDO	O	Phase comparison output between the EFM signal and VCO/2.
12	VSS	—	Connected to GND. (0V)
13	CLK	I	Inputs a clock signal for the serial data transfer from CPU. Latches data at the rise of the clock signal.
14	XLT	I	Latch input from CPU. Latches 8-bit shift register data (serial data from CPU) to each register.
15	DATA	I	Inputs serial data from CPU.
16	$\overline{\text{XRST}}$	I	System reset input. The system is reset at "L" input.
17	CNIN	I	Tracking pulse input.
18	SENSE	O	Outputs the internal state according to the address.
19	MUTG	I	Muting input. When the ATTM in the internal register is "L", the system is in the normal state if the MUTG is "L" and the sound is muted if the MUTG is "H".
20	CRCF	O	Outputs the CRC checking result of sub-code Q. (Reserved)
21	EXCK	I	Clock input for the sub-code serial output. (Connected to GND.)
22	SBSO	O	Sub-code serial output. (Reserved)
23	SUBQ	O	Sub-code Q output.
24	SCOR	O	Sub-code sync S0 + S1 output.
25	SQCK	I/O	Clock signal for reading of sub-code Q.
26	SQEX	I	SQCK select input. (Connected to +5V.)
27	DOTX	O	Digital audio interface output.
28	GFS	O	Display output of the frame sync locking state. Goes "H" when locked.
29 ~ 32	TEST (DB08) ~ TEST (DB05)	—	Connected to GND. (Do not open.) Data terminal of external RAM.
33	VDD	—	Power supply. (+5V)
34 ~ 37	TEST (DB04) ~ TEST (DB01)	—	Connected to GND. (Do not open.) Data terminal of the external RAM.

Pin No.	Pin Name	I/O	Description
38 ~ 48	TEST (RA0) ~ TEST (RA10)	—	Connected to GND. (Do not open.) Address output of the external RAM.
49	TEST ($\overline{\text{RAWE}}$)	—	Connected to GND.
50	TEST ($\overline{\text{RACS}}$)	—	Connected to GND.
51	C4M	O	1/2 division output of the crystal oscillator. f = 4.2336MHz (Reserved)
52	VSS	—	Connected to GND. (0V)
53	XTAI	I	Crystal oscillator input. f = 8.4672MHz
54	XTAO	O	Crystal oscillator output. f = 8.4672MHz (Reserved)
55	MD1	I	MD1="H" at High speed mode. (Not used.) The digital filter is set to OFF at all times (MD3="H"). Digital out is ON only when MD1="L" (N-SPD) and MD2="L".
56	MD2	I	
57	MD3	I	
58	SLOB	I	Input to switch the code of the audio data output. "L" causes the 2 second complement output and "H" causes the offset binary output. (Connected to GND.)
59	PSSL	I	Input to switch the mode of the audio data output. "L" causes serial output and "H" causes parallel output. (Connected to GND.)
60	APTR	O	Aperture correction control output. 44.1kHz with the filter OFF. (Reserved)
61	APTL	O	Aperture correction control output. 44.1kHz with the filter OFF. (Reserved)
62	DA01 (C1F1)	O	DA01(LSB of parallel audio data) output with PSSL = "H". C1F1 output with PSSL = "L". (Reserved)
63	DA02 (C1F2)	O	DA02 output with PSSL = "H". C1F2 output with PSSL = "L". (Reserved)
64	DA03 (C2F1)	O	DA03 output with PSSL = "H". C2F1 output with PSSL = "L". (Reserved)
65	DA04 (C2F2)	O	DA04 output with PSSL = "H". C2F2 output with PSSL = "L". (Reserved)
66	DA05 (C2FL)	O	DA05 output with PSSL = "H". C2FL output with PSSL = "L". (Reserved)
67	DA06 (C2PO)	O	DA06 output with PSSL = "H". C2PO output with PSSL = "L". (Reserved)
68	DA07 (RFCK)	O	DA07 output with PSSL = "H". RFCK output with PSSL = "L". (Reserved)
69	DA08 (WFCK)	O	DA08 output with PSSL = "H". WFCK output with PSSL = "L". (Reserved)
70	DA09 ($\overline{\text{PLCK}}$)	O	DA09 output with PSSL = "H". PLCK output with PSSL = "L". (Note 1)(Reserved)
71	DA10 (VGFS)	O	DA10 output with PSSL = "H". VGFS output with PSSL = "L". (Reserved)
72	DA11 (GTOP)	O	DA11 output with PSSL = "H". GTOP output with PSSL = "L". (Reserved)
73	VDD	—	Power supply (+5V)
74	DA12 ($\overline{\text{RA0V}}$)	O	DA12 output with PSSL = "H". RA0V output with PSSL = "L". (Reserved)
75	DA13 (C4LR)	O	DA13 output with PSSL = "H". C4LR output with PSSL = "L". (Reserved)
76	DA14 ($\overline{\text{C210}}$)	O	DA14 output with PSSL = "H". C210 output with PSSL = "L".
77	DA15 (C210)	O	DA15 output with PSSL = "H". $\overline{\text{C210}}$ output with PSSL = "L". (Note 2)(Reserved)
78	DA16 (DATA)	O	DA16(MSB of parallel audio data) output with PSSL = "H". DATA output with PSSL = "L". (Note 3)
79	WDCK	O	Strobe signal output. 88.2kHz with the filter OFF.
80	LRCK	O	Strobe signal output. 44.1kHz with the filter OFF.

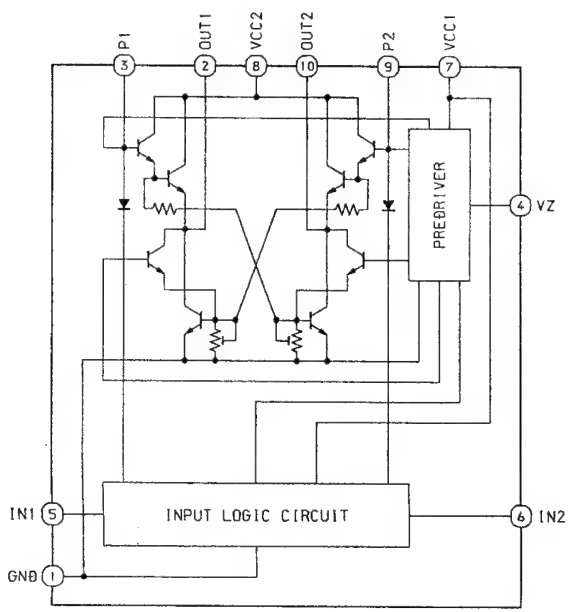
Note 1) $\overline{\text{PLCK}}$: VCO/2 output. When locked to the EFM signal, f = 4.3218MHz.
Note 2) C210: Bit clock signal. f = 2.1168MHz
Note 3) DATA: Audio signal serial data output.

IC BLOCK DIAGRAM

IC,BA6296FP

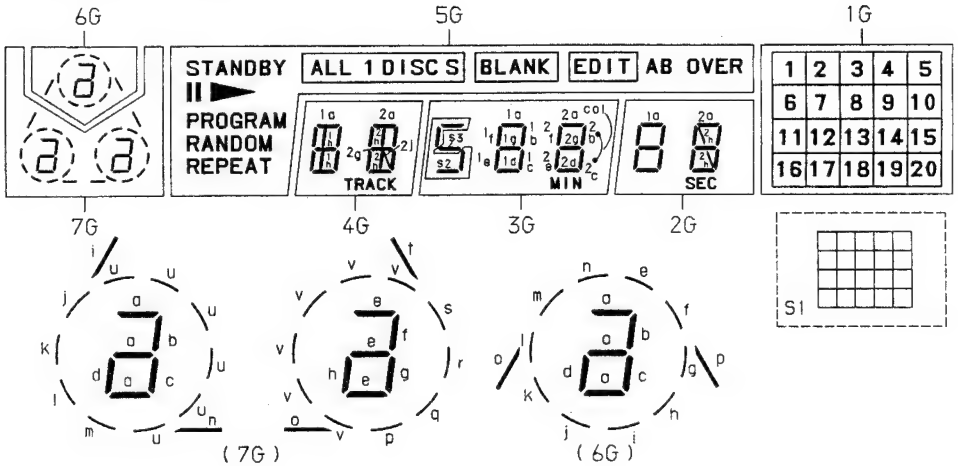


IC,LB1641



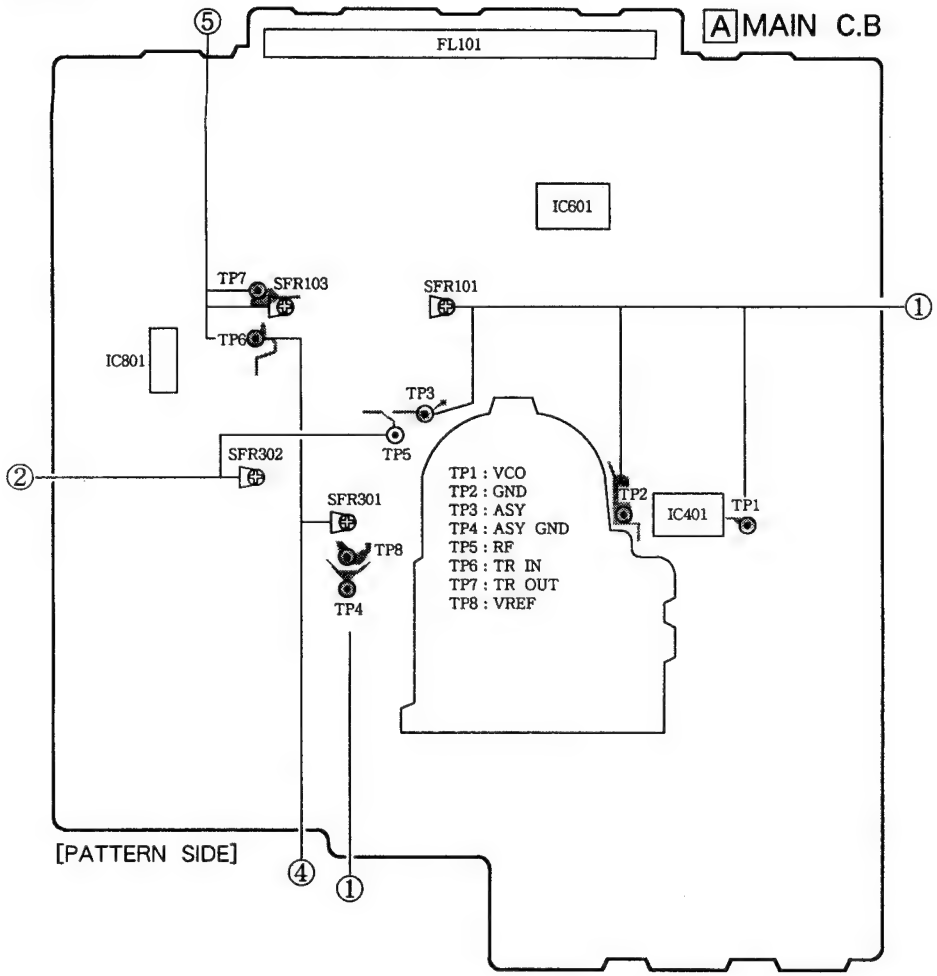
GRID ASSIGNMENT

FL101 7BT – 171GK



ANODE CONNECTION

	7G	6G	5G	4G	3G	2G	1G
P1	i	o	OVER	1a	1a	1a	1
P2	j	l	B	1b	1b	1b	2
P3	d	d	ALL S	1c	1c	1c	6
P4	b	e	1	1d	1d	1d	8
P5	a	o	DISC	1e	1e	1e	7
P6	l	n	EDIT	1f	1f	1f	4
P7	m	k	BLANK	1g	1g	1g	5
P8	k	m	A	1h	S2	—	3
P9	c	f	►	2a	2a	2a	9
P10	u	b	II	2b	2b	2b	10
P11	h	p	—	2c	2c	2c	14
P12	f	—	—	2d	2d	2d	17
P13	t	n	—	2e	2e	2e	16
P14	o	j	RANDOM	2f	2f	2f	12
P15	v	g	REPEAT	2g	2g	2g	13
P16	n	c	PROGRAM	2h	S3	2h	11
P17	e	i	—	2j	(col)	—	15
P18	s	—	—	TRACK	MIN	SEC	18
P19	g	—	—	—	—	—	19
P20	r	—	—	—	—	—	20
P21	q	—	—	—	—	—	S1
P22	p	—	—	—	—	—	—
P23	—	—	STANDBY	—	—	—	—



Note : • Connect a probe (10 : 1) of the frequency counter or the oscilloscope to a test point.
• Connect the ⊖ probe of the oscilloscope to TP8 (VREF) for each adjustment.

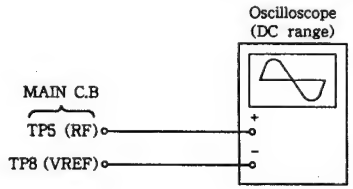
① VCO Frequency Adjustment

1. Connect and short between TP3 (ASY) and TP4 (ASY GND).
2. Connect the frequency counter to test points TP1 (VCO) and TP2 (GND).
3. When the power is off, turn the power on by pressing the OPEN/CLOSE and STOP/CLEAR keys at the same time.(All lit mode.)
4. Insert the disk and play it.
5. Adjust SFR101 (VCO) so that the frequency counter reading is 4.27 ± 0.02 MHz.
6. After the adjustment is completed, remove the short lead wires from TP3 (ASY) and TP4 (ASY GND).

Note : When releasing all lit up, disconnect the FG connector or turn the power off.

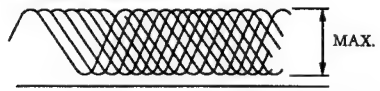
② Focus Bias Adjustment

Make the focus bias adjustment when replacing and repairing the optical block.



1. Connect an oscilloscope to test points TP5 (RF) and TP8 (VREF).
2. Turn on the power switch.
3. Insert test disc TCD-782 (YEDS-18) and play back the second composition.
4. Adjust SFR302 (F.B) so that the amplitude of waveform on the oscilloscope is maximized.

RF signal waveform



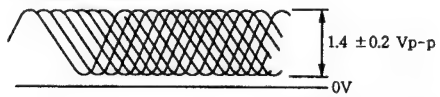
VOLT/DIV : 50 mV
TIME/DIV : 0.5 μS

③ RF Waveform Check

This check should be performed whenever the optical system block is repalced in repair.

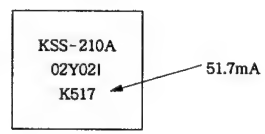
1. Connect an oscilloscope to test points TP5 (RF) and TP8 (VREF).
2. Turn on the power switch.
3. Insert test disc TCD-782 (YEDS-18) and play back the second composition.
4. Check that the waveform appears as shown in the figure below.

RF signal waveform



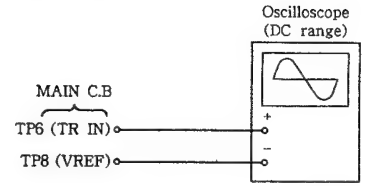
VOLT/DIV : 50 mV
TIME/DIV : 0.5 μS

Note : The current of the laser signal can be checked with the voltages on both sides of R312 (10 Ω). The difference for the specified value shown on the label must be within ± 6.0 mA.

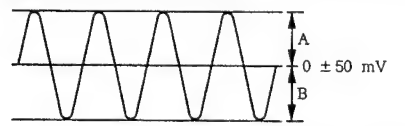


$$\text{Laser current Iop} = \frac{\text{Voltage across R312}}{10\,\Omega}$$

④ Tracking Balance Adjustment



1. Set SFR103 (TG) to minimum.
2. Connect an oscilloscope to test points TP6 (TRIN) and TP8 (VREF).
3. Turn on the power switch.
4. Insert test disc TCD-782 (YEDS-18) and press the PLAY (▶) button.
5. Press the FF key repeatedly.
6. Adjust SFR301 (TB) so that the waveform on the oscilloscope is vertically symmetrical as shown in the figure below.
7. After the adjustment is completed, remove the ground lead wires from the terminals.



A = B

VOLT/DIV : 50 mV
TIME/DIV : 1 mS

⑤ Tracking Gain Adjustment

A servo analyzer is necessary in order to perform this adjustment exactly. However, this gain has a margin, so even if it is slightly off, there is no problem. Therfore, do not perform this adjustment. Focus/tracking gain determines the pick-up follow-up (vertical and horizontal) relative to mechanical noise and mechinical shock when 2-axis device operates. However,as these gains are reciprocated, the adjustment is performed so that both gains are satisfied.

- When gain is raised, the noise increases when the 2-axis device opearates.
- When gain is lowered, it is more susceptible to mechanical shock and skipping occurs more easily.

When the gain adjustment is not satisfied, tye symptoms below appear.

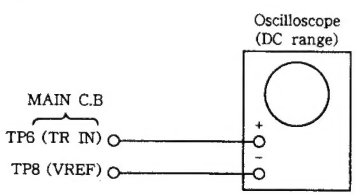
Gain / Symptoms	(Focus)	Tracking
● The time until music starts becomes longer for STOP→▶ PLAY or automatic selection (⏮ ⏭ buttons pressed.) (Normally takes about 2 seconds.)	low	low or high
● Music does not start and disc continues to rotate for STOP →▶ PLAY or automatic selection (⏮ ⏭ buttons pressed.)	–	low
● Disc stops to rotate shortly after STOP→▶ PLAY.	low or high	–
● Sound is interrupted during PLAY. Or time counter display stops.	–	low
● More noises during the 2-axis device operation.	high	high

The following is simple adjustment method.

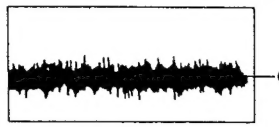
– Simple adjustment –

Note : Since the adjustment cannot be performed exactly, remember the positions of the controls before the adjustment and compare the adjusted position and the original position.
If the difference is a little, return the control to the original position.

Procedure :



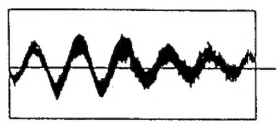
1. Keep the set horizontal. (If the set is not kept horizontally, this adjustment cannot be performed due to the gravity against the 2-axis device.)
2. Insert test disc TCD-782 (YEDS-18) and play back the second composition.
3. Connect an oscilloscope to TP6 (TR IN) of the main board.
4. Adjust SFR103 (TG) so that the waveform appears as shown in the figure below.(tracking gain adjustment)



VOLT/DIV : 50 mV
TIME/DIV : 1 mS

● Incorrect example (The fundamental wave appears as compared with the waveform adjusted.)

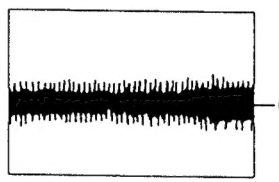
Low tracking gain



VOLT/DIV : 50 mV
TIME/DIV : 1 mS

High tracking gain

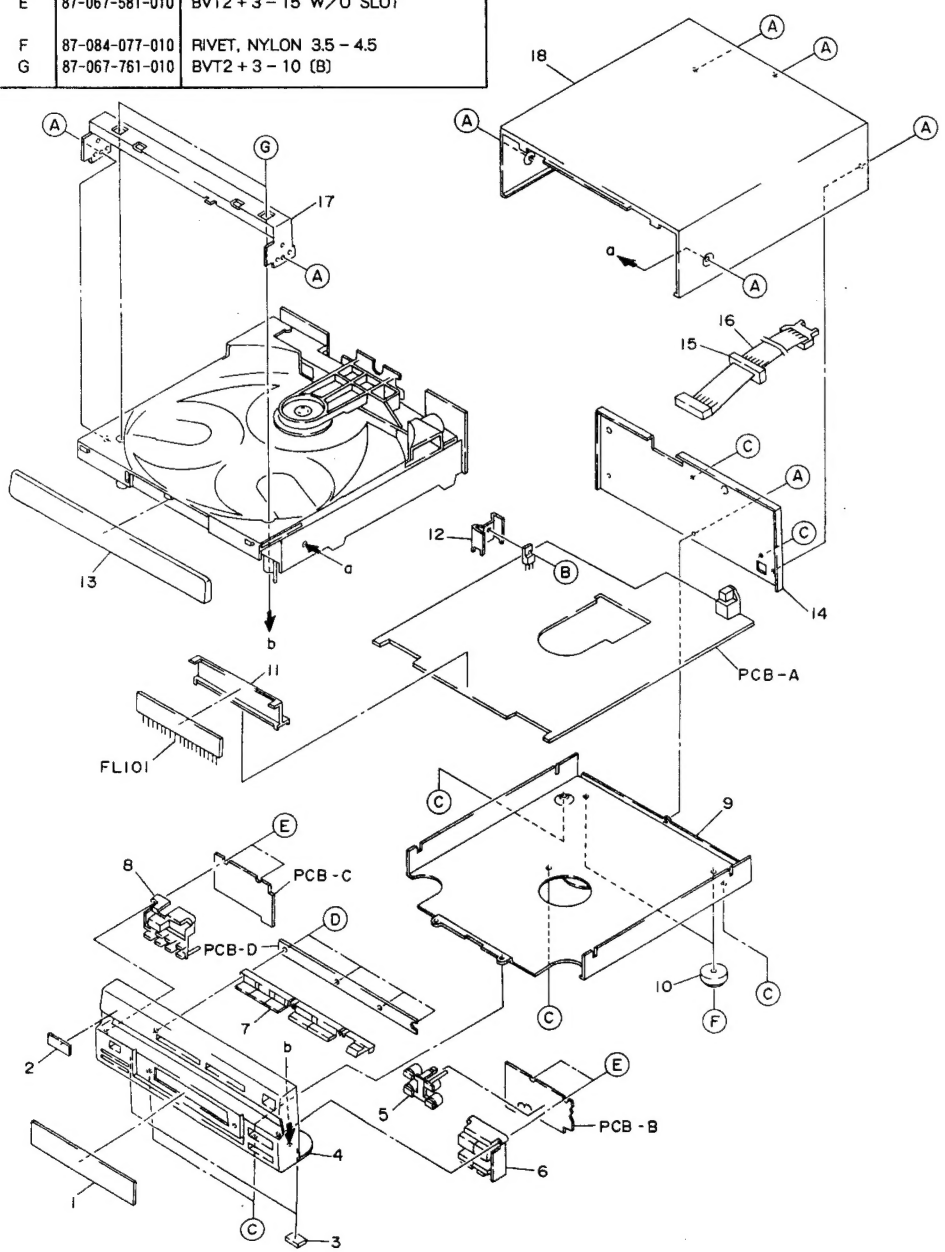
The frequency of the fundamental wave is higher than that in low gain.



VOLT/DIV : 50 mV
TIME/DIV : 1 mS

EXPLODED VIEW – 1

REF. NO.	PART NO.	DESCRIPTION
A	87-743-095-410	UT2 + 3 – 8 W/O SLOT
B	87-067-579-010	BIT2 + 3 – 8 W/O SLOT
C	87-067-660-010	BVT2 + 3 – 8 WO SLOT (B)
D	87-067-758-010	BVT2 + 3 – 12 W/O SLOT
E	87-067-581-010	BVT2 + 3 – 15 W/O SLOT
F	87-084-077-010	RIVET, NYLON 3.5 – 4.5
G	87-067-761-010	BVT2 + 3 – 10 (B)

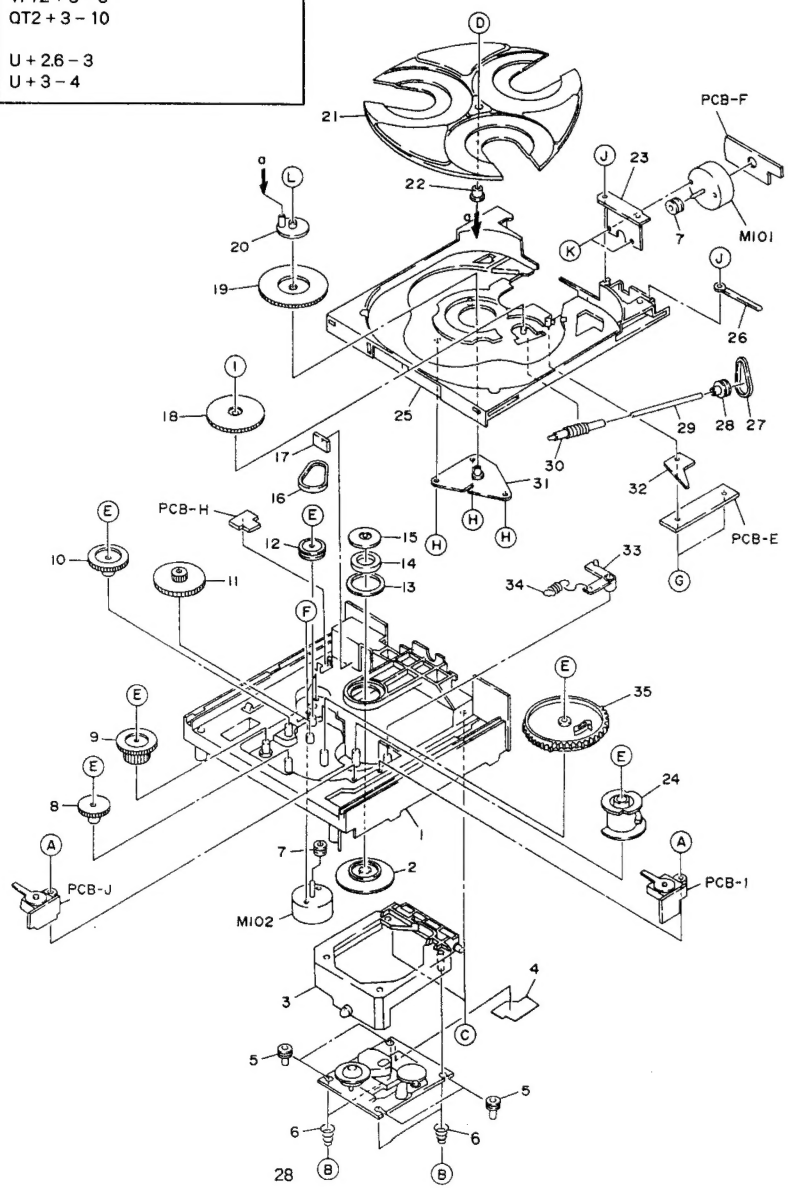


MECHANICAL PARTS LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	1-1	★81-VM2-004-010	WINDOW	※	1
	1-2	★81-MX4-032-019	BADGE, AIWA		1
	1-3	★81-VM1-206-010	FELT, 15 – 12		2
	1-4	★81-VM2-001-010	CABINET, FRONT (B) (Y)	※	1
	1-4	★81-VM2-014-010	CABINET, FRONT (B) (YU)	※	1
	1-4	★81-VM2-021-010	CABINET, FRONT (N) (YU)	※	1
	1-4	★81-VM2-002-010	CABINET, FRONT (W) (YU)	※	1
	1-5	★81-VM1-205-010	GUIDE, LED (B) (Y)		1
	1-5	★81-VM1-209-010	GUIDE, LED (B, N, W) (YU)		1
	1-6	★81-VM1-005-010	KEY, PLAY		1
	1-7	★81-VM1-007-010	KEY, OPEN (B)		1
	1-7	★81-VM2-025-010	KEY, OPEN (N)	※	1
	1-7	★81-VM2-008-010	KEY, OPEN (W)	※	1
	1-8	★81-VM1-006-010	KEY, POWER (B)		1
	1-8	★81-VM2-024-010	KEY, POWER (N)	※	1
	1-8	★81-VM2-007-010	KEY, POWER (W)	※	1
	1-9	★81-VM1-201-010	PLATE, BOTTOM		1
	1-10	★87-085-218-010	FOOT		2
	1-11	★81-VM1-203-010	GUIDE, FL		1
	1-12	---	HEAT SINK		1
	1-13	★81-VM1-016-010	PANEL, TRAY (B)		1
	1-13	★81-VM2-022-010	PANEL, TRAY (N)	※	1
	1-13	★81-VM2-005-010	PANEL, TRAY (W)	※	1
	1-14	★81-VM2-010-110	PANEL, REAR (B) (Y)	※	1
	1-14	★81-VM2-003-110	PANEL, REAR (B) (YU)	※	1
	1-14	★81-VM2-027-010	PANEL, REAR (N) (YU)	※	1
	1-14	★81-VM2-020-010	PANEL, REAR (W) (YU)	※	1
	1-15	★89-VT5-202-010	BUSHING, CORD		1
	1-16	★81-VM1-647-110	9P FG WIRE ASSY		1
	1-17	★81-VM1-202-010	CHASSIS, FRONT		1
	1-18	★81-VM1-009-010	CABINET, STEEL (B)		1
	1-18	★81-VM2-026-010	CABINET, STEEL (N)	※	1
	1-18	★81-VM2-019-010	CABINET, STEEL (W)	※	1

EXPLODED VIEW – 2

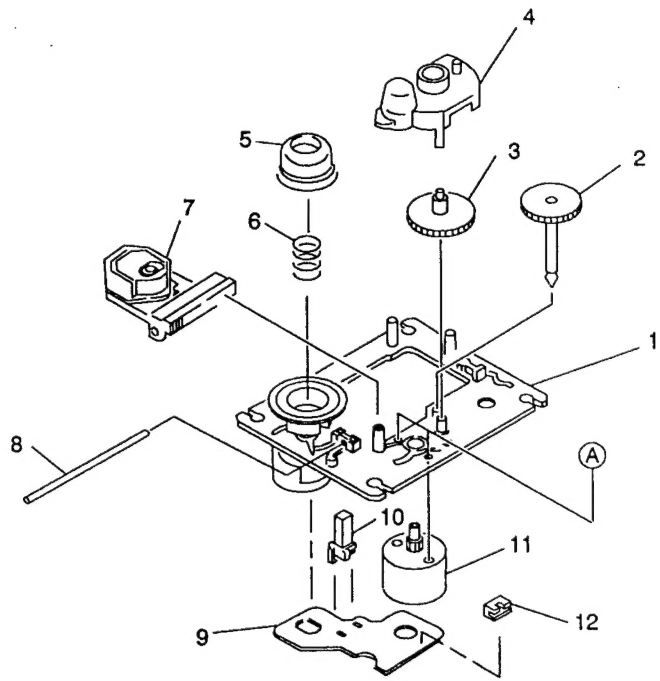
REF. NO.	PART NO.	DESCRIPTION
A	81-653-215-010	SPECIAL SCREW VT2
B	87-067-944-010	VF + 1.7 – 4
C	87-561-096-210	VFT1 + 3 – 10
D	81-ZG1-239-010	S – SCREW, TT
E	87-067-945-110	VFT1 + 3 – 12
F	87-251-071-410	U + 2.6 – 4
G	87-067-579-010	BVT2 + 3 – 8 W/O SLOT
H	87-751-094-410	VT2 + 3 – 6 W/O SLOT
I	87-761-095-410	VFT2 + 3 – 8
J	87-721-096-410	QT2 + 3 – 10
K	87-251-070-410	U + 2.6 – 3
L	87-251-092-410	U + 3 – 4



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	2-1	★81-ZG1-201-010	CHASSIS, MECHANISM		1
	2-2	★81-ZG1-228-010	HOLDER, MAGNET		1
	2-3	★81-ZG1-226-010	MECHANISM HOLDER ASSY		1
	2-4	★81-ZG1-241-010	SHEET, CD MECHANISM		1
	2-5	★81-ZG1-230-010	G – CUSHION, MECHANISM		4
	2-6	★81-ZG1-231-010	C – SPRING, MECHANISM		4
	2-7	★81-ZG1-212-010	PULLEY, LOADING MOTOR		2
	2-8	★81-ZG1-209-010	GEAR, TRAY RELAY		1
	2-9	★81-ZG1-208-010	GEAR, TRAY B		1
	2-10	★81-ZG1-207-010	GEAR, TRAY A		1
	2-11	★81-ZG1-210-010	GEAR, RELAY		1
	2-12	★81-ZG1-211-010	PULLEY, RELAY		1
	2-13	★81-ZG1-242-010	SHEET, MAGNET		1
	2-14	★86-531-219-010	MAGNET, CLAMPER		1
	2-15	★81-ZG1-229-010	PLATE, MAGNET		1
	2-16	★81-ZG1-232-010	BELT, TRAY		1
	2-17	★81-ZG1-238-010	CUSHION, TRAY IN		1
	2-18	★81-ZG1-222-010	WORM WHEEL, TT		1
	2-19	★81-ZG1-202-010	GEAR, MAIN		1
	2-20	★81-ZG1-224-010	TT LEVER ASSY		1
	2-21	★81-ZG1-002-010	TURNTABLE (B, N) (Y, YU)		1
	2-21	★81-ZG1-004-010	TURNTABLE (W) (YU)		1
	2-22	★81-ZG1-219-010	SHAFT, TRAY		1
	2-23	★81-ZG1-215-010	HOLDER, MOTOR		1
	2-24	★81-ZG1-206-010	GEAR, MECHANISM CAM		1
	2-25	★81-ZG1-001-010	TRAY (B, N) (Y, YU)		1
	2-25	★81-ZG1-003-010	TRAY (W) (YU)		1
	2-26	---	BINDER, WIRE		1
	2-27	★81-ZG1-233-110	BELT, TT		1
	2-28	★81-ZG1-236-010	PULLEY, TT MOTOR		1
	2-29	★81-ZG1-216-010	SHAFT, WORM		1
	2-30	★81-ZG1-221-010	WORM GEAR, TT		1
	2-31	★81-ZG1-225-010	TRAY PLATE ASSY		1
	2-32	★81-ZG1-240-010	P – SPRING, WORM		1
	2-33	★81-ZG1-213-010	PLATE, CAM		1
	2-34	★81-ZG1-235-010	E – SPRING, CAM		1
	2-35	★81-ZG1-205-110	GEAR, TRAY CAM		1

EXPLODED VIEW – 3

REF. NO	PART NO.	DESCRIPTION
A	87-261-032-210	V+ 2-3



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q. TY
	3-1	★9X-262-513-310	TT CHASSIS ASSY (W/MOTOR)		1
	3-2	★92-625-188-020	GEAR, A		1
	3-3	- - -	GEAR, B		1
	3-4	★92-625-544-010	COVER		1
	3-5	92-625-187-010	RING, CENTER		1
	3-6	★92-625-191-010	SPRING, COMPRESSION		1
	3-7	98-848-127-110	PICK UP KSS – 210A		1
	3-8	★94-917-565-010	SHAFT, SLED		1
	3-9	- - -	MOTOR PWB		1
	3-10	91-572-085-110	SWITCH, LEAF (LIMIT)		1
	3-11	★9X-262-513-210	SLED MOTOR ASSY		1
	3-12	★91-564-722-110	CONNECTOR 6P		1